

WHAT IS CLAIMED IS:

1. An electronic component comprising:

a piezoelectric element having electrodes at two end portions thereof; and

at least a pair of lead terminals having cup-shaped holder portions arranged to hold both end portions of the piezoelectric element;

a conductive joining material arranged such that the cup-shaped holder portions and the electrodes disposed at both end portions of the piezoelectric element are electrically and mechanically connected by the conductive joining material; and

wherein the at least a pair of lead terminals are made of a conductive wire, one end portion of the lead terminals is bent outwards at an angle of about 90 degrees, a flat portion is defined by a press extended portion on the tip side from the bending point so as to be extended substantially parallel to a lead portion of the lead terminal, and the cup-shaped holder portion is defined by the flat portion being bent inwards.

2. An electronic component according to Claim 1, wherein the electronic component is a resonator.

3. An electronic component according to Claim 1, wherein the at least a pair of lead terminals comprises three lead terminals.

4. An electronic component according to Claim 1, further comprising a packaging resin, wherein the piezoelectric element, the at least a pair of lead terminals and the conductive joining material are sealed within the packaging resin.

5. An electronic component according to Claim 1, wherein the piezoelectric element is an energy trap thickness shear vibration mode element.

6. An electronic component according to Claim 1, wherein each of the at least a pair of lead terminals are made of a round lead wire of about 0.48 mm in diameter.

7. An electronic component according to Claim 1, wherein each of the at least a pair of lead terminals includes a wire made of a low-carbon steel and having copper plated on a surface thereof and a molten solder plated on the copper plating.

8. An electronic component according to Claim 1,

wherein a width of the flat portions is about 0.8 mm to about 1.0 mm and a thickness of the flat portions is about 0.15 mm to about 0.2 mm.

9. An electronic component according to Claim 1, wherein one of the at least a pair of terminals includes a middle terminal that is bent so as to have a step-like configuration.

10. An electronic component according to Claim 1, further comprising a capacitor element held between the cup-shaped holder portions and a tip portion of one of the lead terminals, and is electrically and mechanically connected to the holder portions the conductive joining material.

11. A method for manufacturing an electronic component, comprising the steps of:

preparing a pair of conductive wires;

bending one end portion of the conductive wires outwards at an angle of about 90 degrees;

forming a flat portion by press extending at least the portion on the tip side from the bending point so as to be extended substantially parallel to a lead portion of the lead terminal;

forming a cup-shaped holder portion by bending the flat

portion inwards;

holding both end portions of a piezoelectric element in a pair of the cup-shaped holder portions; and

electrically and mechanically connecting the cup-shaped holder portions and the electrodes formed in both end portions of the piezoelectric element by using a conductive joining material.

12. A method for manufacturing an electronic component as claimed in claim 11, further comprising the step of plating molten solder on the conductive wire.

13. A method for manufacturing an electronic component as claimed in claim 11, wherein the lead portions as the other end of the conductive wires are welded and fixed to a metal hoop material with pilot holds having a fixed distance therebetween.

14. A method for manufacturing an electronic component as claimed in claim 11, wherein the step of bending one end portion of the conductive wires outwards at an angle of about 90 degrees is done at a location about two thirds away from the tip of the flat portions.

15. A method for manufacturing an electronic component

as claimed in claim 11, further comprising the step of providing a capacitor element between the cup-shaped holder portions and a tip portion of one of the lead terminals, and electrically and mechanically connecting the capacitor to the holder portions via the conductive joining material.

16. A method for manufacturing an electronic component as claimed in claim 11, further comprising the step of integrally sealing the piezoelectric element, the pair of lead terminals and the conductive joining material in a packaging resin.

17. A method for manufacturing an electronic component according to Claim 11, wherein the electronic component is a resonator.

18. A method for manufacturing an electronic component according to Claim 11, wherein the piezoelectric element is an energy trap thickness shear vibration mode element.

19. A method for manufacturing an electronic component according to Claim 11, wherein each of the lead terminals are made of a round lead wire of about 0.48 mm in diameter.

20. A method for manufacturing an electronic component

according to Claim 11, wherein each of the lead terminals includes a wire made of a low-carbon steel and having copper plated on a surface thereof and a molten solder plated on the copper plating.

21. A method for manufacturing an electronic component according to Claim 11, wherein a width of the flat portions is about 0.8 mm to about 1.0 mm and a thickness of the flat portions is about 0.15 mm to about 0.2 mm.

2025 RELEASE UNDER E.O. 14176